INDEPENDENT AIRFIELD LIGHTING MAINTENANCE SOLUTIONS

IS YOUR AIRFIELD LIGHTING FIT FOR PURPOSE?

The aviation industry prides itself on there being no single point of failure in the system that could on its own, cause a fatal accident. Runway lighting is an important part of this system, especially in low visibility conditions.

Following extensive research into flight safety ICAO has developed standards for airfield light characteristics i.e. Beam intensity, orientation and colour as well as recommended practices in preventive maintenance that "shall be established at an aerodrome to maintain facilities in a condition which does not impair the safety, regularity or efficiency of air navigation." Annex 14 Chapter 10.5 Visual Aids.

As an airport operator there are two key questions that must be answered regarding airfield light fixtures:

1. **Are your lights working safely i.e. serviceable according to ICAO and FAA?**
   There have been many recorded instances where an aircraft has been unable to visually locate a runway in low visibility conditions...Sometimes with disastrous consequences.
2. **Are your lights in danger of becoming FOD (foreign object debris)?**
   There have also been many recorded occurrences of airfield lights becoming FOD.

Why MALMS™?

- Accuracy – MALMS products are designed and tested regularly to ensure accuracy
- Independent – MALMS measurement systems are free from external influence and have a long established reputation for integrity
- Easy to use
- Rapid measurement – Allows the job to be done quickly and efficiently
- MALMS products are robust, designed for the harsh airfield environment
- Designed with fault tolerance to prevent operator errors with automatic monitoring and quality checks to ensure data integrity
- Inbuilt diagnostics, dedicated support function plus global agency network provide effective customer support
- Using MALMS will maximise runway availability, minimise costs and generate a rapid return on investment

Investment in MALMS will:

- Reduce the risk of accidents to aeroplanes, passengers and staff
- Reduce cost of diversions and delays
- Ensure regulatory compliance
- Optimise runway/taxiway availability as part of a Planned Preventative Maintenance System leading to improved passenger numbers
- Support accurate IRVR calculation resulting in improved safety
- Deliver effective light cleaning and navigation tools, reducing unplanned maintenance as part of an efficient preventative maintenance regime (Differential Maintenance), which is cheaper than alternatives such as block change

MALMS PHOTOBENCH

MALMS ENGINEER

MALMS CLEANER

MALMS MOBILE

MALMS DASHBOARD

Investing in **MALMS** will yield a rapid return on investment

YOU CAN'T MANAGE WHAT YOU DON'T MEASURE

MALMS MOBILE & TRANSVERSE SYSTEMS

IS YOUR AIRFIELD LIGHTING SERVICEABLE?

Using a mobile photometric test system as part of a preventative maintenance system is the only way to achieve the runway serviceability requirements specified in national and international standards for beam intensity and orientation (ICAO Annex 14, EASA, FAA AC 150/5345-46E).

Regulations state that for a precision approach runway, lighting systems should be measured using a mobile unit of sufficient accuracy to analyse the characteristics of individual lights. Most importantly, the accurate calculation of IRVR (required to determine whether it is safe to land and how many aircraft can be landed safely per hour) is reliant upon runway lighting operating effectively.

So why do airports choose MALMS for photometric testing as part of their preventative maintenance?

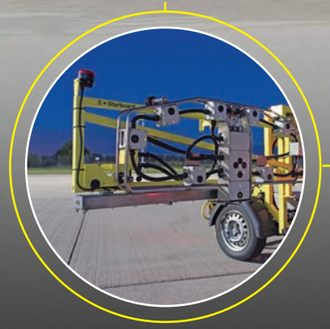
- MALMS Mobile is designed to ensure accuracy and repeatability of measurement, and has been independently tested to ICAO and FAA test criteria
- MALMS Transverse provides airports with an accurate tool to rapidly measure runway thresholds, end bars, stop bars and approach lights up to 1m/3ft in height
- Essential for busy airports, MALMS Mobile can survey at speeds in excess of 80kph/50mph, meaning a 3000m/10,000ft runway centreline of 200 lights takes less than 5 minutes to measure
- MALMS Mobile can be used by a single operator requiring no specialist training, and is compatible with any vehicle fitted with a tow bar
- Its rugged design is perfect for the harsh airfield environment and can be set-up without the need for tools that could become FOD (foreign object debris)
- MALMS has inbuilt diagnostics, dedicated support team plus a global agency network to provide effective customer support

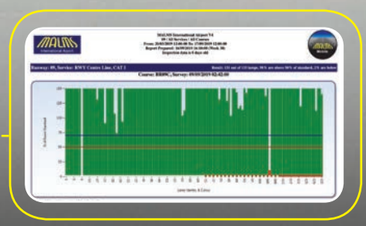
MALMS photometric testing systems are:

- Relied upon by pilots to ensure they get the required visual cues when they need them, especially in low visibility conditions
- Widely used by airports to maximise capacity and demonstrate safe operation
- Relied upon by Regulators & Airport Licensing Authorities to provide independent evidence that an airport is operating in compliance with regulations
- Used regularly by airports as part of their preventative maintenance system to maintain serviceable lighting according to ICAO and FAA test criteria
- Used for commissioning runways and taxiway lighting to reduce the risk of a new or re furbished airfield lighting installation failing to meet the required standard
- Used by airfield lighting manufacturers to test new lights

YOU CAN'T MANAGE WHAT YOU DON'T MEASURE

OVER 2 MILLION LIGHTS TESTED PER YEAR





MALMS PHOTOBENCH TESTER

THE AIRFIELD LIGHTS ARE ON BUT ARE THEY WORKING CORRECTLY?

Studies have shown that without photometric testing as part of an airports quality assurance procedures, many new and refurbished lights fail to achieve the serviceability requirements specified in national and international standards for beam intensity and orientation (ICAO Annex 14, EASA, FAA AC 150/5345-46E) before they are installed, meaning airports are replacing a defective light with another potentially defective light.

The MALMS Photo Bench and Workshop Testers measure the photometric performance of light fixtures quickly, simply and accurately before they are installed on the airfield. Each is a self-contained system that can measure both LED and Tungsten Halogen fittings with near-laboratory measurement accuracy yet requires only a small floor area and no special dark room. MALMS Photo Bench incorporates a 4.5 metre test tunnel and enhanced testing features compared to the 'compact' Workshop Tester with its 3 metre test tunnel and basic software.

Why do so many airports choose MALMS Workshop and Photometric Bench Testers as part of their preventative maintenance system?

- MALMS Workshop and Photometric Bench Testers are designed to ensure accuracy and are independently tested for conformance with the criteria for beam intensity and orientation defined in ICAO Annex 14, EASA, FAA AC 150/5345-46E
- Easy to use: Connect the fitting, close the tester door and a pass or fail result is indicated in approximately 30 seconds
- Requires only a small floor area and no special dark room
- Rugged scientific measurement equipment designed and built for airfield maintenance workshop environments
- MALMS systems deliver class leading reliability which is why so many systems are in use around the world
- Data integrity is ensured through automatic monitoring, quality checks and innovative design aimed at preventing operator errors
- Provides a comprehensive, traceable audit and history trail for airfield lighting and maintenance processes
- All information is captured and recorded electronically (no manual input)
- Demonstrates that an airport is operating safely and in compliance with regulations
- Significant, verifiable cost savings provide a rapid return on investment

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MALMS ENGINEER

ARE YOUR AIRFIELD LIGHTS IN DANGER OF BECOMING FOD?

MALMS Engineer is an inspection and maintenance solution that measures the current status of an airfield's Lighting Assets and Planned Preventative Maintenance KPI's.

MALMS Engineer is designed to manage airfield lighting and pavement maintenance data recorded during lighting inspections. This allows real-time reporting including runway serviceability, cleaning status, torque management, fault status, inspection status and any pavement issues.

Developed following several incidents where airfield ground lighting fixtures have suffered bolt failures resulting in aircraft damage. ICAO Annex 14 section 10.1.1 states "a maintenance programme, including preventive maintenance where appropriate, shall be established at an aerodrome to maintain facilities in a condition which does not impair the safety, regularity or efficiency of air navigation."

MALMS Engineer incorporates a 4G/Wi-Fi capable PC tablet for the recording of maintenance and inspection tasks. All maintenance and inspection activity including scheduled and remedial tasks are synchronized in real-time with a traditional or cloud based server.

MALMS Engineer incorporates a work scheduling and reporting tool that may be operated independently or integrated with the MALMS range of products to deliver the MALMS Differential Maintenance Strategy or with an airports existing asset management system.

Adopting MALMS Engineer will provide airports with the assurance that all their light fittings are being inspected and maintained in compliance with ICAO annex 14, FAA AC 150/5340-26C and FAA Engineering Brief #83, In-pavement Light Fixture Bolts – mandatory for all airport projects funded with federal grant monies.

Why do airports choose MALMS Engineer to manage their airside assets?

- MALMS Engineer incorporates an innovative range of MALMS electronic torque wrenches that can be used as part of an airports planned preventative maintenance system to reduce the risk of foreign object debris (FOD)
- Supports the provision of airfield lighting inspection and maintenance services in accordance with best practices leading to a higher standard of runway maintenance
- Moving airside map supports rapid airfield navigation and location/recording of faults
- GPS and RFID capability allow positive identification of individual light fixtures and other airside assets and faults, removing the need to paint ID's on the tarmac
- RFID tagging of fittings ensures only serviceable lights are installed and the right model of the light is fitted in the correct location
- Supports many of the recommendations set out in National and International Standards and provides the means to demonstrate that an airport is operating safely
- Replaces paper recording methods with an accurate digital solution
- Incorporates extensive reporting to alert management with key performance information concerning asset performance, list of work undertaken as well as outstanding or overdue maintenance
- Provides a maintenance audit trail to evidence what work was done, who did it and the results

YOU CAN'T MANAGE WHAT YOU DON'T MEASURE

1000+ RUNWAYS MAINTAINED

MALMS AUTOMATIC & MANUAL CLEANERS

WHY DO AIRFIELD LIGHTS BECOME UNSERVICEABLE SO QUICKLY?

The MALMS Automatic or Manual Airfield Lighting Cleaners provide airport operators with fast and effective methods for cleaning runway and taxiway lights.

These Cleaners have been developed in response to ICAO 10.5.2 "A system of preventive maintenance of visual aids shall be employed to ensure lighting and marking system reliability" and the need to have a fast and effective means to clean airfield light lenses. Contamination of the airfield light lens is the principal factor affecting photometric performance. A single aircraft movement can deposit sufficient rubber to make a new light fixture unserviceable. A study at a major UK airfield calculated that newly cleaned runway lighting will become unserviceable in just 8 days (earlier if a runway is de-iced).

A number of cleaning methods have been developed to address the problem, however these have a number of limitations and significant drawbacks. Both MALMS airfield lighting cleaning systems have been developed to overcome the disadvantages of other methods whilst improving the effectiveness of cleaning.

Both may be used 'standalone' or integrated as part of the MALMS family of products. MALMS Airfield Lighting Cleaners can utilise the information from MALMS Mobile and MALMS Engineer to schedule automatic or manual cleaning of an individual light or an entire runway service e.g. Centreline or TDZ.

By importing the results from a MALMS Photometric test MALMS Cleaners can direct an operator to the lights identified as requiring maintenance; ensuring minimum runway occupancy time and optimum runway light serviceability. This comprehensive reporting of maintenance activity facilitates cost control and efficiency.

MALMS Automatic Cleaner:

- Fast and effective removal of rubber, de-icing fluid, paint and other contaminants
- No chemicals to contaminate fitting, no thermal shock (dry ice), no water ingress (steam or water jet), no scratching from brushes
- Automatic detection of lights, cleaning both sides of a bi-directional light within seconds by compressed air and soda blast material
- Designed for single operator use
- Includes facility to manually clean elevated light fittings with lance
- Audit Trail of maintenance activity to identify when each light was cleaned and by whom
- Developed for year round use, operates at temperatures between -20°C to +50°C

MALMS Manual Cleaner:

- Fast and effective cleaning of airfield lights
- Requires two personnel, lance operator plus vehicle driver
- Inbuilt camera so the driver can stop the MALMS Cleaner in the correct position for the light fixture to be cleaned
- Manual lance cleaning of bi-directional lights with compressed air and soda blast material
- No chemicals to contaminate fitting, no thermal shock (dry ice), no water ingress (steam or water jet), no scratching from brushes
- The action of cleaning triggers the recording (via GPS) of each light location cleaned
- Audit Trail of maintenance activity to identify when each light was cleaned and by whom
- Developed for year round use, operates at temperatures between -20°C to +50°C

YOU CAN'T MANAGE WHAT YOU DON'T MEASURE

70% OF THE TOP 100 AIRPORTS USE MALMS

MALMS DASHBOARD

MEASURING YOUR KPIs JUST GOT EASIER

A web based solution for the monitoring of MALMS airfield lighting maintenance and asset management.

MALMS Dashboard is a predominately cloud based solution, but can also be made available on a local airport server where all maintenance and inspection data is synchronised with a 4G/wi-fi capable PC tablet. Data collected by airport engineers/electricians such as photometric test results, lighting inspections, faults and maintenance recording, preventative and remedial maintenance tasks, as well as pavement issues can all be viewed in real time by accessing the MALMS Dashboard from any internet capable device.

The MALMS Dashboard is designed to give airports information in a modern and easy to use high level summary with drill down functionality to data on individual light assets. The MALMS Dashboard can be configured based on airports maintenance programs such as 30, 60, 90 or 180 days cycle. Each user can configure the MALMS Dashboard to their own preference. As well as seeing the data from a dashboard, data can also be viewed from an online map, a calendar or from an asset tree structure.

Customised email trigger reporting is a key feature of the MALMS Dashboard allowing users to be notified when maintenance, inspections and photometric tests have been completed.

MALMS Dashboard provides the following distinct activities:

- Live data reporting
- Customised dashboard based on individual users requirements
- Updated faults and asset serviceability tiles with drill down to individual areas of the airfield
- Runway serviceability summary tile showing the photometric performance of the runways based on CAT I/II/III serviceability levels
- Includes drill down functionality to the individual test course data
- The current torque and cleaning status of individual light assets demonstrating when maintenance was undertaken and by whom
- Individual light inspections undertaken by the airport can be shown, demonstrating when completed and any faults recorded by the operator
- Pavement issues found on the airfield can be recorded with GPS location, comments and a photograph of the deficiency concerned
- Digital audit trail provides evidence of inspection schedule, serviceability and maintenance providing real time asset management to any airport
- Demonstrates that an airport is operating in accordance with company and national standards
- Email alerts providing reports and fault alerts including asset serviceability changes or maintenance activities
- Integration with existing airports works order management systems

YOU CAN'T MANAGE WHAT YOU DON'T MEASURE

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Vancouver Airport (YVR) selected MALMS after seeing these products in use at London Heathrow and Stansted Airport as well as receiving positive feedback from other airports in the Vancouver Airport Services Group.

Vancouver Airport (YVR) is happy to recommend the MALMS range of photometric test equipment for use at other airports.

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Maintenance Services Manager
Vancouver Airport, Canada

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Birmingham Airport has been a user of the MALMS range of products since 1998.
Our use of the MALMS range of products and the principal of differential maintenance has allowed our airfield engineers to maintain the runway AGL services to the highest standards.

Birmingham Airport is happy to recommend the use of the MALMS range of products to other airports looking to maintain their AGL services to the highest standards.

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Airfield Manager
Birmingham Airport, England

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Riga International Airport has been using MALMS products as an invaluable tool in maintaining its runway to national and international standards, saving manpower, money and minimising disruption.

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Chairman of the Board
Riga International Airport, Latvia

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Our AGL maintenance components (photometric testing, airfield inspections, torque management, maintenance work) are fulfilled by MALMS which allows our engineers to manage assets in a more structured and efficient manner.
The MALMS product range comes highly recommend and is a key element of our Asset Management strategy.

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Asset Care Manager – Airfield Dublin
Airport, Republic of Ireland

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Since MALMS equipment has been used at King Shaka International Airport, AGL performance has improved drastically.
The technical support and software knowledge provided by TMS (Tailor Made Systems Ltd) has been invaluable.
King Shaka International Airport would like to recommend the use of the MALMS range of photometric test equipment to any airport which strives to maintain their AGL services to the highest standards.

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First Electrician – Airside
King Shaka International Airport, South Africa

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